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THE TANANARIVE OBSERVATORY.

BY

W. H. HUNT.

It is an undeniable fact that if Protestant missionaries effect in new countries a great deal apart from the mere propagation of the Gospel, as was the case in Madagascar when during the early years of the last century they introduced so many of the mechanical arts, the Jesuit missionaries stand very near the head in works demanding a knowledge of the higher sciences.

The names of the Reverend Fathers Roblet and Colin will be always as intimately associated with the great African island as that of Grandidier, the distinguished French explorer. Long before the French Government took in hand the cartography of Madagascar, the Rev. Father Roblet had completed the triangulation of the two great interior provinces of the island. For the most complete tables of meteorological observations taken in Madagascar for years before the island was attracting much notice we are indebted to the Roman Catholic Mission. By a strange coincidence, I am told when the English Government, on the occasion of the last transit of Venus, sent a scientific expedition to the west coast of Madagascar to take observations, it was a Jesuit priest, Dr. Perry, who was in charge of the Mission. From the time when, more than twenty years ago, Father Roblet had traced out an enormous ellipse, chiselled in the flag-stones of the Mission courtyard at Tananarive, forming a sun-dial by the shadow of a huge iron rod thrown out horizontally from the gables of the house, to the present day of a scientifically constructed observatory, many discoveries have been made. Those who suffer damage from the periodical cyclones which visit these parts ought to be among the foremost to appreciate the value of an observatory at Tananarive. The distinguished labors of Dr. Meldrum, of Mauritius, have done so much in that direction during the past quarter of a century and more that a sister institution on this island cannot fail to be of great advantage.

A recent number of the *Revue de Madagascar* contains an interesting short notice of the observatory at Tananarive, written by Monsieur Clique, in charge of the Press service at Tamatave, and I cannot omit to give a translation of it in English, both as a sidelight upon the two pioneers of the work in Madagascar and as also worthy of notice to the scientific world in view of the invaluable services which it may eventually render:

About a mile and a half east of the capital, on a summit of a barren hill called Ambohidempona, is seen a white cupola, having the appearance of an Arab mosque. This is the new Tananarive Observatory, the only French scientific institution of its kind in the southern hemisphere. A tortuous and difficult path leading to it brings the visitor to an elevation above the sea of 1,402 metres, or more than 4,000 feet.

The present construction is quite new, the first building having been destroyed in 1895, during the war, just before the taking of Tananarive, for it is from this mountain of Ambohidempona that the first shells were thrown into the Queen's Palace. During the course of the Franco-Malagasy hostilities most of the astronomical instruments were carried off, either by orders of the Queen and her Ministers, or they were simply stolen by the natives and sold at ridiculous prices, spoiled or rendered worthless by the fools who meddled with them. A chronometer, for instance, of extreme value, the property of the Government, lent by the Admiralty, had been sold for one dollar! When, after the conquest, they could be partly recovered, very few of the instruments were intact, and a great number had to be sent to France for repairs, to replace the stolen and lost parts. In their simplicity the Malagasy imagined that the great equatorial telescope was a menacing cannon, a terrible engine of destruction, and that its stand was the gun-carriage! Orders were given to destroy everything before the arrival of the French.

It was necessary, therefore, to think of re-erecting the building. Father Colin, the enterprising founder, and the learned Father Roblet consequently appealed to the colony for help in the work. General Gallieni very judiciously replied to them, that "The Malagasy had destroyed the Observatory and the Malagasy might rebuild it"! So, one hundred impressed labourers were assigned to the task. Father Colin himself added six skilled workmen and set to work personally, and, as had been the case with the construction of the first building, he had to be by turns architect, mason, and carpenter.

The task was one of considerable difficulty. Material was hard to procure, and forced labour left much to be desired. An observatory, in fact, is not an ordinary building. For the instruments to attain perfect precision, indispensable to astronomical observations, it had to be built in such a manner that the flooring remained isolated from the walls and the pillars supporting the telescope, which, in their turn, must be placed on bed-rock. Lime was indispensable to give the desired solidity and cohesion to the materials.

Happily the foundations of the first observatory were not destroyed. They could be used for the second, and the forced labourers had only to go to the bottom of the ravines of Ambohidempona and bring up the stones which the Senegalese soldiers had rolled down to the bottom of the mountain for fun, having nothing better to do while they were camped on the ruins after the surrender of Tananarive. The building, by dint of great labor, was completed after twelve months' work. Although not of the same proportions as its predecessor, the present Observatory is none the less an important edifice, of imposing aspect. The observatory destroyed by the Hovas consisted of a central octagon twenty-five feet in diameter. Starting from the first story, it was made circular, so as to support the large dome ; on three sides of the octagon were pavilions supporting towers, each supplied with a smaller cupola. The new Observatory has only one large cupola at the end of the main building. It has cost

$2,000—a sum which the Minister of Education granted as a subsidy to the Observatory.

This money spent, there still remained the cupola to be erected, and the estimate amounted to $1,200. At this very time the Geographical Society of Paris had the happy idea of awarding the Herbert-Fournet prize to the Reverend Fathers Roblet and Colin, which allowed them to devote immediately the sum to the purchase and erection of this cupola. From that time forth the Tananarive Observatory was on the way to completion, and could maintain the good reputation it had acquired since 1889 by its important meteorological, astronomical, magnetic, and geodetic statistics furnished to the scientific world.

The transportation to Tananarive of the framework of the cupola from Majunga was beset with difficulties, the immense iron work weighing nearly five tons. Father Colin, who had not forgotten the great obstacles he had to overcome in 1890, in getting up the great equatorial telescope, had recommended it to be packed in cases weighing about 100 pounds each, but this method was not practicable with the heavy framework of the cupola. General Gallieni, therefore, decided to entrust this delicate work to the artillery corps. The sections complete were enclosed in eight cases twelve feet long, and were brought up by the Majunga road on Lefebvre carts drawn by mules, the only practicable means of transportation along the whole route. The journey required two months.

But that was not all; it was now necessary to get it up. Father Colin, aided by a single workman, set to work himself hammering into shape the strained parts, so that at the end of a month the revolving dome of the observatory was in its place and in working order. The packing of the different sections of the cupola had been done while the paint was still fresh, so that the excessive temperature of the Red Sea soon had something to say to it. Father Colin, after having been machinist, had to turn painter, and re-painted the whole cupola. The Observatory, since July, 1899, could thus resume its ordinary routine of work, so long interrupted. This does not imply that the necessary outfit for the perfect working of the Observatory is complete. Father Colin is in need of numerous instruments, and has gone to France to procure them. The Tananarive Observatory possesses, besides the large equatorial telescope which Admiral Mouchez, the then Director of the Paris Observatory, procured for it in 1890, a meridian circle which works with precision, astronomical, meteorological and magnetic instruments of all kinds—seismographic, mareographic, etc.

His favorable position allowed Father Colin, in 1891, to make one of the rare observations of the passage of Mercury between our planet and the sun by establishing the exact moment when the phenomenon took place. All the cyclones which devastated the coasts and interior of Madagascar or of South Africa can be registered; and if Father Colin had only had at his disposal a rapid means of communication with Vohemar and Diego Suarez at the time of the hurricane of *December 15th last*, he might have been able to give the parts of the country concerned most valuable warning of the storm which was threatening them.

TAMATAVE, MADAGASCAR.